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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/750,224

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Alan M. Myers

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EXAMINER

QUACH, TUAN N

ART UNIT

PAPER NUMBER

2826

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/20/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/750,224

Applicant(s)

MYERS ET AL.

Examiner

Tuan Quach

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-15 and 27-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14 and 15 is/are allowed.
- 6) ☒ Claim(s) 2-4, 6, 7, 9-11, 13, 27-29 is/are rejected.
- 7) ☒ Claim(s) 5, 8 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.


**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

  
Tuan Quach  
Primary Examiner

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.

- 4) ☒ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. attached.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

### **DETAILED ACTION**

The indicated allowability of claims 2-4, 6, 7, 9-11, 13, 27-29 are withdrawn in view of the newly discovered reference(s) to Kim et al. Rejections based on the newly cited reference(s) follow.

Claims 2, 27-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 2, the period after "one or more electro-osmotic pumps in a layer over the second face" needs to be replaced by a semi-colon. In claim 27, a period needs to be deleted. In claim 28 line 4, and claim 29 line 2 "channel" needs to be replaced by "channels"; also in claim 29 line 1, "pumping means" needs to be replaced by "pump".

### ***35 U.S.C. 102 Rejections***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2-4, 6, 7, 9-11, 13, 27-29 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication No. 2004/012827 to Kim et al. (hereafter "Kim").

Art Unit: 2826

Re claim 2, Kim illustrates in at least figures 5-7 and the associated text an apparatus comprising: an electronics chip having a substrate (206/204) with a first face thereof having circuitry (028) thereon, and an opposite second face (face of 204 on the side of 216); and one or more electro-osmotic pumps (112) in a layer (212) over the second face wherein the electro-osmotic pumps include capillary pump channels (para. 0028, not illustrated) [would appear similar to channels 114 shown in Figs. 1 and 2] in a further layer (214, 216) [the channels would have to go through these layers to reach the substrate 204] over the second face of the electronic chip. Note further that:

- 1) In looking at applicant's specification, it appears that the terms "capillary pump channels" pump cooling fluid in the capillary channels, see [0106]. In the Kim reference (2004/0120827), the micro-channels allow passage of a fluid through the cooling layer to facilitate cooling, see [0020]. Thus it appears that the capillary pump channel of the instant application and micro channel of Kim accomplish the same task.
- 2) In looking at figure 1 of Kim, the pumps (112) are in operative layer 106. The micro channels 114 are in substrate 104 (as well as 106), thus in a "further layer". Note, the claim does not call for the capillary pump channel to be "completely" in the further layer.

Re claims 3 and 6, Kim teaches electronics chip in substrate 206/204 above and channels [would appear similar to channels 114 shown in Figs. 1 and 2] in further layer (214/216), and as indicated in [0022] the channels 114 can run in one or more layers.

Re claims 4 and 7, external fluid connections at lateral or side edges is shown, e.g., Fig. 3, ports (190,192).

Re claims 9, Kim illustrates in at least figures 5-7 and the associated text an apparatus comprising: an electronics chip having a substrate (206/204) with a first face thereof having circuitry (208) thereon, and an opposite second face (face of 204 on the side of 216); and one or more electro-osmotic pumps (112) in a layer (212) over the

Art Unit: 2826

second face wherein the electro-osmotic pumps include cooling channels and capillary pump channels (para. 0028, not illustrated) [would appear similar to channels 114 shown in Figs. 1 and 2] in a further layer (214, 216) [the channels would have to go through these layers to reach the substrate 204] over the second face of the electronic chip. Again, note further that:

1) In looking at applicant's specification, it appears that the terms "capillary pump channels" pump cooling fluid in the capillary channels, see [0106]. In the Kim reference (2004/0120827), the micro-channels allow passage of a fluid through the cooling layer to facilitate cooling, see [0020]. Thus it appears that the capillary pump channel of the instant application and the cooling channels and the micro channel of Kim accomplish the same task.

2) In looking at figure 1 of Kim, the pumps (112) are in operative layer 106. The micro channels 114 are in substrate 104 (as well as 106), thus in a "further layer". Note, the claim does not call for the capillary pump channel or cooling channel to be "completely" in the further layer.

Re claim 10, this corresponds to claim 9 above with the electronics chip having a substrate (206/204) of silicon [0033], with a first face thereof having circuitry (208) thereon, and an opposite second face (face of 204 on the side of 216); and one or more electro-osmotic pumps (112) in a layer (212) of silicon [0032] over the second face wherein the electro-osmotic pumps include cooling channels (para. 0028, not illustrated) [would appear similar to channels 114 shown in Figs. 1 and 2] in a further layer (214, 216) [the channels would have to go through these layers to reach the substrate 204] over the second face of the electronic chip; the cooling channels are considered to correspond to micro channels 114 in Kim as they allow passage of a fluid through the cooling layer to facilitate cooling as delineated above, and wherein the layer

Art Unit: 2826

106 corresponds to an operative layer thus would encompass silicon for active devices to be formed therein [0022].

Re claim 11, external fluid connections at lateral or side edges is shown, e.g., Fig. 3, ports (190,192).

Re claim 13, this corresponds to claim 2 above and further recites electronics chip of silicon thus taught in [0033], substrate (206/204) above and capillary channels in layer of silicon thus corresponds to layer 212 of silicon [0032] as delineated above; the capillary channels correspond to microchannels 114 as delineated above. .

Re claims 27 and 28 Kim as applied above also illustrates an apparatus comprising an electronics chip (206/204), an electro-osmotic pump (112) for circulating cooling fluid through cooling channels adjacent a face of the chip wherein the electro-osmotic pump and the cooling channels are in separate layers of material, e.g., (212) versus (214, 216) or (106) vs. (104), see also [0022] wherein the channels 114 may run in one or more than one layer thus corresponding to separate layers as in claim 27 and in same layer when the channels 114 run in one layer as in claim 28 wherein such would read on layer (106).

1) In looking at applicant's specification, it appears that the terms "capillary pump channels" pump cooling fluid in the capillary channels, see [0106]. In the Kim reference (2004/0120827), the micro-channels allow passage of a fluid through the cooling layer to facilitate cooling, see [0020]. Thus it appears that the capillary pump channel or cooling channels of the instant application and micro channel of Kim accomplish the same task.

2) In looking at figure 1 of Kim, the pumps (112) are in operative layer 106. The micro channels 114 are in substrate 104 (as well as 106), thus in a "further layer". Note, the claim does not call for the capillary pump channel or cooling channels to be "completely" in the further layer.

Re claim 29, the pump and cooling channels being in same plane is also apparent in Figs. 1 and 2.

Claims 5, 8, 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 14 and 15 are allowed.

The prior art above do not show the limitation regarding the electrical power for the electro-osmotic pumps being conducted by electrical conductors formed through the electronics chip as being in claims 5, 8, 12, and the respective memory coupled to the processor, the input/output system including the display unit coupled to the processor and a power supply coupled to the processor as in claim 14 or the respective antenna coupled to the telecommunications circuit, the input/output system including the display unit coupled to the telecommunications circuit and a power supply coupled to the telecommunications circuit as in claim 15.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Tuan Quach whose telephone number is 571-272-1717. The examiner can normally be reached on M-F from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Sue Purvis can be reached on 571-272-1236. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 2826

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



**Tuan Quach**  
**Primary Examiner**